Short Communications

Browsing by *Lepus capensis* in the Karoo

G.I.H. Kerley
Department of Zoology, University of Port Elizabeth, P.O. Box 1600, Port Elizabeth, 6000 Republic of South Africa

Received 31 August 1989; accepted 17 April 1990

Although previously described as a grazer, *Lepus capensis* utilizes browse extensively in the Karoo. Observations of dietary selection by this species in the Karoo are presented, and potential competition with stock farmers is suggested.

Alhoewel *Lepus capensis* voorheen beskryf is as grasvreters, is hulle ekstensiewe blaarvreters in die Karoo. Waarnemings oor selektiewe dieet deur hierdie spesie word aangebied en potensiële mededinging met veeboere word voorgestel.

Although the Cape hare *Lepus capensis* is common and widespread, there is little information on the diet of this species. Stewart (1971) recorded grasses in the diet of *L. capensis* in East Africa and Smithers (1983) reported them to be grazers, preferring short, green grasses. However, *L. capensis* is not limited in its distribution to grasslands, occurring for example in the Karoo biomes of southern Africa (Smithers 1983), where the vegetation is dominated by dwarf shrubs, grasses being sparse or even locally absent (Acocks 1975). It may therefore be hypothesized that this species is capable of altering its foraging strategy to browsing, and is not an obligatory grazer.

Observations were carried out at the Tierberg Karoo Biome study site (33°10'S / 22°16'E), 25 km east of Prince Albert, South Africa. Vegetation, which Acocks (1975) classified as Karoid broken veld, is typical dwarf shrubland dominated by *Pteronia pallens* and *Eberlanzia ferox*.

I observed hares foraging from 2–10 m distance, on seven occasions (Nov. 1987, Apr. 1988, Jun. 1988 × 2, Sep. 1988 and Oct. 1988 × 2). Individual hares were not identified and it is likely that more than one individual was involved. The observations spanned a total of 75 min. Plants and plant parts (leaves, flowers) being consumed were identified and feeding at each plant was timed to the nearest 5 s to develop an index of utilization. Relative availability of plants was expressed as estimated plant cover, determined by using the canopy line-intercept method (Mueller-Dombois & Ellenberg 1974) over 300 m. The preference index (% consumption / % availability) of Davies, Botha & Skinner (1986) was used to indicate the extent of utilization in relation to availability. A preference index greater than one indicates selection for that item, whereas a value of less than one indicates that the item is being utilized less than its availability would suggest.

A total of 138 plant species have been recorded on the study site, including six grasses (*Enneapogon devauxii, E. scaber, Stipagrostis namaquensis, Aristida congesta, A. cf junciformis* and *Fingeruthia africana* — S. Milton pers. comm.). No grasses were encountered on the 300-m transect, which intercepted plants of 27 species.

Hares became active before sunset, with the earliest activity 45 min before sunset on a cloudy afternoon. There appeared to be a degree of habituation to humans at this research site. Hares would allow an observer to approach to within meters without showing any avoidance behaviour, and would carry on foraging, apparently normally. While under observation, hares spent approximately one third of the time foraging, the remainder being spent in grooming, locomotion, inspecting (sniffing) plants, feces and the ground and in an alert posture.

I recorded hares eating plants of 11 species (Table 1), including five succulents which made up about a quarter of the diet. Hares were not observed eating any grasses. Hares generally consumed the leaves of plants, although for two species only flowers were consumed. The single observation of a hare eating Mesembryanthemaceae capsules which had been collected by harvester termites (*Microhodotermes viator*) and left at a termite foraging port, may indicate possible competition between these taxa. These termite 'haystacks' may represent rich food patches to hares (and other herbivores).

Most plant species were consumed more frequently than expected according to their availability (preference index — Table 1), indicating selection for these species. Two plant species were not selected for, both species in which flowers were eaten. However, in these cases plant

Table 1 Plants consumed by *Lepus capensis* at the Tierberg study site with availability of plants (% of total plant cover) and an index of preference

Plant species	Plant part	Consumption s	Consumption %	Availability %	Preference index **
Galenia fruticosa	leaves	600	40	16,1	2,5
Osteospermum sinuatum	leaves	460	31	7,8	4,0
Psilocaulon sp. *	leaves	90	6	2,4	2,5
Chrysocoma ciliata	flowers	60	4	<0,1	40,0
Tetragonia sp. *	leaves	60	4	0,4	10,0
Zygophyllum sp.	leaves	60	4	<0,1	40,0
Aridaria noctiflora *	leaves	60	4	0,2	20,0
Eberlanzia ferox *	flowers	60	4		0,2
	leaves	50	3	20,0	0,2
Atriplex sp.	leaves	30	2	<0,1	200,0
Moraea speciosa	dry stem	30	2	<0,1	200,0
Hereroa sp. *	flowers	5	0,3	2,2	0,1
Mesembryanthemaceae capsules					

* Succulents

** Preference index = $\frac{\%\text{consumption}}{\%\text{ availability}}$ (Davies, Botha & Skinner 1986)

cover would not be a reliable measure of availability as flowers represent a small proportion of the plant canopy and are also only temporarily present.

From these observations it may be concluded that Cape hares are not obligate grazers but are capable of utilizing browse, a strategy which allows this species to exploit a wide range of habitats besides grasslands. Cape hares are selective browsers, selecting a subset of the 138 plant species available at this site, and using these species intensely. More observations will undoubtedly lead to further plant species being included in the diet of *L. capensis*.

The two plant species that were dominant in the diet of hares at Tierberg (*G. fruticosa* and *O. sinuatum*) are also considered to be important forage species for the small stock industry (P. Marincowitz, pers. comm.). Similarly, sheep also only eat the flowers of *Chrysocoma ciliata*, avoiding the foliage (du Preez 1968). This may indicate competition between hares and stock farmers, although differences in foraging behaviour, browse level, muzzle size, etc. between small stock and hares need to be taken into account. An extended study of the diet of *L. capensis*, combined with density estimates, is needed to quantify the extent of this competition.

Acknowledgements

I am grateful to Sue Milton for the identification of plants and for constructive comments on an earlier draft of the manuscript. This work was funded by the CSIR as part of the Karoo Biome Project.

References

ACOCKS, J.P.H. 1975. Veld types of South Africa. *Mem. Bot. Surv. S. Afr.* 40: 1–128.

DAVIES, R.A.G., BOTHA, P. & SKINNER, J.D. 1986. Diet selected by springbok *Antidorcas marsupialis* and merino sheep *Ovis aries* during Karoo drought. *Trans. Roy. Soc. S. Afr.* 46: 165–176.

DU PREEZ, C.H.R. 1968. [Bitter bush in the Karoo.] *Boerdery S. Afr.* 44: 27–29. [In Afrikaans.]

MUELLER-DOMBOIS, D. & ELLENBERG, H. 1974. Aims and methods of vegetation ecology. John Wiley and Sons, New York.

SMITHERS, R.H.N. 1983. The mammals of the southern African subregion. University of Pretoria, Pretoria.

STEWART, D.R.M. 1971. Diet of *Lepus capensis* and *L. crawshayi*. *E. Afr. Wildl. J.* 9: 161–162.

Polytocy in the Cape serotine bat *Eptesicus capensis* (A. Smith 1829) from the southern African subregion

M. van der Merwe

Mammal Research Institute, University of Pretoria, Pretoria, 0002 Republic of South Africa

Received 28 November 1989; accepted 17 April 1990

Polytocy is described in the Cape serotine bat, *Eptesicus capensis*, and discussed in relation to the occurrence of multiple births in other microchiropteran bat species in the southern African subregion. Although twins appear to be characteristic of the Cape serotine bat, triplets and even the occasional quadruplets occur.

Politokie in die Kaapse dakvlêrmuis, *Eptesicus capensis*, word beskryf en bespreek met verwysing na die voorkoms van veelvoudige geboortes in ander mikrochiroptera vlêrmuisspesies in die Suider-Afrikaanse substreek. Alhoewel dit wil voorkom asof tweelinge kenmerkend is by die Kaapse dakvlêrmuis, blyk dit dat drielinge en selfs die periodieke vierling voorkom.

The Cape serotine bat is a common vespertilionid in the Transvaal with a wide habitat tolerance (Rautenbach 1982). They occur in small numbers, and during the daytime two or three animals are found huddled together under the bark of trees, at the base of aloe leaves as well as in the roofs of houses, where they are tucked away between overlapping sheets of corrugated iron or between beams and rafters (Smithers 1983). They emerge before dark (Smithers 1983) and have often been reported to hunt in congregations (Rautenbach 1982). The average number of foetuses carried by females is 1,6 with a normal range of one or two (Smithers 1983). Both Rautenbach (1982) and Smithers (1983), however, have collected a single female bearing three foetuses, which the latter author regarded as unusual.

During August 1988 and September 1989, seven and five female Cape serotine bats respectively were collected at the farm Klipfontein, 30 km north-east of Vaalwater in the Transvaal (24°08'S / 28°18'E). Specimens were caught with two 30 × 10 m mist-nets (Rautenbach 1985). All specimens were brought to the laboratory alive where they were sacrificed using ether, and their reproductive tracts dissected out and preserved in Bouin's fluid. The uteri of those collected during August 1988 were serially sectioned at 5 μm for microscopic investigation, while the uteri of those collected during September 1989 were opened and examined macroscopically.

Three of the seven females collected during August 1988 each had three embryos at the morula stage in their uterine horns, while the rest each had two embryos. In two of the females with triplets the distribution of the embryos was two in the right and one in the left uterine horn whereas in the third female all three embryos were in the right uterine horn. It is not certain whether this was their final distribution as transmigration to the left